APPENDIX E — READING & UNDERSTANDING FERTILIZER LABELS

Selection and application of fertilizers requires a basic knowledge about how to read and understand fertilizer labels.

Fertilizers come in two forms—chemically based or natural based. Most **chemically based** fertilizers are simple compounds. Nitrogen is synthesized from the atmosphere to create ammonia and urea. Phosphate and potash are obtained from naturally occurring mined deposits that are minimally processed to make the nutrients more available to plants. **Natural based** fertilizers are derived from organic materials such as fish waste, bone meal, or food processing by-products. Natural based fertilizers are low in plant nutrient content and are slower to release their nutrients in a plant-available form.

Understanding Fertilizer Labels

Fertilizers are typically identified with three numbers. These three numbers are generally printed in large, bold characters on the fertilizer container and refer to the percentage of "primary" nutrients, nitrogen (N), phosphate (P), and potassium (K), in the container. For example, a bag of 24-5-11 analysis fertilizer contains 24 percent nitrogen, five percent phosphate and 11 percent potassium. Therefore, a 50-pound bag of 24-5-11 analysis fertilizer would contain 12 pounds of nitrogen, 2.5 pounds of phosphorous, and 5.5 pounds of potassium.

Bag Weight		% of Nutrients		Pounds of Nutrients
50 lbs.	x	0.24	=	12.0 lbs. of nitrogen
50 lbs.	x	0.05	=	02.5 lbs. of phosphate
50 lbs.	x	0.11	=	05.5 lbs. of potassium
				20.0 lbs. (total weight of nutrients)

As illustrated in the above example, the total weight of the nitrogen, phosphate, and potassium will never equal the total weight of the fertilizer container. The remainder of the contents in a fertilizer container is comprised of a mixture of one or more "secondary nutrients" (i.e., calcium, magnesium, and sulfur), "micro-nutrients" or as they are sometimes referred to as "trace" elements, (i.e., boron, chlorine, copper, iron, manganese, molybdenum, and zinc), and a filler material (generally sand or granular limestone).

Calculating Fertilizer Application Rates

Fertilizers are generally applied by the coverage rate listed on the packaging (e.g., 25 lbs./5,000 ft^2) or based on a soil test.

Applying fertilizer according to soil tests usually requires converting the total weight of the nutrients in the bag of fertilizer to lbs./ft^2 because soil test recommendations are typically

expressed in terms of lbs./square foot or lbs./1,000 square feet. To calculate the lbs./ft^2, the applicator needs to divide the total weight of each nutrient by the square foot coverage listed on the fertilizer container. For most home use fertilizers, the typical rate of coverage is for an area of 5,000 or 10,000 square feet. In the above example, if the area of coverage for the 50 lb. bag is listed as 10,000 square feet then the amount of each nutrient per square foot would be calculated as follows.

Total Weight of Nutrients		Coverage Area Listed on Bag		Weight of Nutrient per Square Foot
12 lbs.	÷	10,000 ft^2	=	0.0012 lbs. of nitrogen/ft^2
2.5 lbs.	÷	10,000 ft^2	=	0.00025 lbs. of phosphorous/ft^2
5.5 lbs.	÷	10,000 ft^2	=	0.00055 lbs. of potassium/ft^2

The next step is to determine how much fertilizer from the bag needs to be applied based on the soil test. If an applicator wants to fertilize an area that is 40 feet by 60 feet and the soil test for the above example recommends 0.5 lbs. of nitrogen per 1,000 square feet, then the applicator would need to apply 5 lbs. of the fertilizer to the area.

40 ft x 60 ft = 2,400 ft^2

(2,400 ft^2 ÷ 1,000 ft^2) x 0.5 lbs. of nitrogen = 1.2 lbs. of nitrogen

(1.2 lbs. of nitrogen x 50 lb. bag) ÷ 12 lbs. of nitrogen/bag = 5 lbs.

Additional information about reading fertilizer labels, application rates, and timing of application based on land use can be obtained from your local county cooperative extension service. For information, visit the Web at www.ces.purdue.edu/counties.htm.